Teacher **Dean Medek** **Subject** **Algebra 1** **Date** **4/20-24/2020** **7-12 Weekly Planner**

Welcome to our Distance Learning Classroom! **Student Time Expectation per day: 30 minutes**

Content Area & Materials	Learning Objectives	Tasks • Unplugged Option • Digital Option • Blended Combination	Check-in Opportunities • Phone Call • Video Call • Email • Messaging platform	Submission of Work for Grades • Expectation • Evidence: Log, Product • Method: Scan, photo, upload, or deliver
ALGEBRA 1 **Polynomials, terminology, adding and multiplying** **Monomials** **Polynomials**	Students will be able to identify polynomials by degree, number of terms, and standard form. Students will be able to multiply two monomials, and a monomial and a binomial. Students will recognize Special Products of binomials: The difference of two squares and binomial squares	• Notes: What are Polynomials? • Notes: Multiplying a polynomial by a monomial • Naming Polynomials and Multiplying Monomials • Notes: Multiplying Binomials • 7.2 Multiplying Polys Notes and CW	Phone Call (Google Voice): (209) 425-1452 during office hours	Read each notes page. Complete the assignment using the notes page as a guide. You may either submit the page electronically (scan or photo) to Mr. Medek's email (dmedek@tusd.net), OR bring it to the school with this header: Student Name: Teacher Name: **Medek** Subject: **Algebra 1** Period: **3** Assignment Week #: **1**

Scheduled, *if possible,* **Shared Experience** • Virtual Fieldtrip • Discussion	Contact Mr. Medek by (Google Voice): (209) 425-1452 during office hours				
Scaffolds & Supports	Each written assignment is preceded by specific notes. Use the notes to do the assignment. Show all calculations				
Teacher Office Hours *2 hours daily (all classes):* • Contact • Platform	**Monday 9-11 (Algebra emphasis: 10-11) Zoom and Google phone**	**Tuesday 9-11 (Algebra emphasis: 10-11) Zoom and Google phone**	**Wednesday 9-11 (Algebra emphasis: 10-11) Zoom and Google phone**	**Thursday 9-11 (Algebra emphasis: 10-11) Zoom and Google phone**	**Friday 9-11 (Algebra emphasis: 10-11) Zoom and Google phone**

What Are Polynomials? By Deb Russell

Polynomials are algebraic expressions that include real numbers and variables. Division and square roots cannot be involved in the variables. The variables can only include addition, subtraction, and multiplication.

Polynomials contain more than one term. Polynomials are the sums of monomials.

- A monomial has one term: 5y or $-8x^2$ or 3.
- A binomial has two terms: $-3x^2$ 2, or 9y - $2y^2$
- A trinomial has 3 terms: $-3x^2$ 2 3x, or 9y - $2y^2$ y

The degree of the term is the exponent of the variable: $3x^2$ has a degree of 2. When the variable does not have an exponent - always understand that there's a '1' e.g., 1^x

Example of Polynomial in an Equation

x^2 - 7x - 6

(Each part is a term and x^2 is referred to as the leading term.)

Term	Numerical Coefficient
x^2 -7x -6	1 -7 -6

$8x^2$ 3x -2	Polynomial	
$8x^{-3}$ 7y -2	NOT a Polynomial	The exponent is negative.
$9x^2$ 8x -2/3	NOT a Polynomial	Cannot have division.
7xy	Monomial	

Polynomials are usually written in decreasing order of terms. The largest term or the term with the highest exponent in the polynomial is usually written first. The first term in a polynomial is called a leading term. When a term contains an exponent, it tells you the degree of the term.

Here's an example of a three-term polynomial:

- **$6x^2$ - 4xy 2xy:** This three-term polynomial has a leading term to the second degree. It is called a second-degree polynomial and often referred to as a trinomial.
- **$9x^5$ - 2x $3x^4$ - 2:** This 4 term polynomial has a leading term to the fifth degree and a term to the fourth degree. It is called a fifth degree polynomial.
- **$3x^{3:}$** This is a one-term algebraic expression that is actually referred to as a monomial.

One thing you will do when solving polynomials is combined like terms.

- **Like** terms: 6x 3x - 3x
- **NOT** like terms: 6xy 2x - 4

The first two terms are like and they can be combined:

- **5x**
- ^{2} **$2x^2$ - 3**

Thus:

- $10x^4$ - 3

Kuta Software - Infinite Algebra 1

Student Name ____________________

Mr. Medek
Algebra 1
Period 3
Assignment Week #1

Naming Polynomials

Name each polynomial by degree and number of terms.

1) $2p^4 + p^3$

Answer: 4th degree binomial

2) $-10a$

3) $2x^2$

4) $-10k^2 + 7$

5) $-5n^4 + 10n - 10$

6) $-6a^4 + 10a^3$

7) $6n$

8) 1

9) $-9n + 10$

10) $5a^2 - 6a$

11) $8p^5 - 5p^3 + 2p^2 - 7$

12) $-7n^7 + 7n^4$

13) $-8n^4 + 5n^3 - 2n^2 - 8n$

14) $9v^7 + 7v^6 + 4v^3 - 1$

Notes

Explain 2 Multiplying a Polynomial by a Monomial

Remember that the Distributive Property states that multiplying a term by a sum is the same thing as multiplying the term by each part of the sum then adding the results.

Example 2 Find each product.

(A) $3x(3x^2 + 6x - 5)$

$3x(3x^2 + 6x - 5)$ Distribute and simplify.

$= 3x(3x^2) + 3x(6x) + 3x(-5)$

$= 9x^{1+2} + 18x^{1+1} - 15x^1$

$= 9x^3 + 18x^2 - 15x$

(B) $2xy(5x^2y + 3xy^2 + 7xy)$

$2xy(5x^2y + 3xy^2 + 7xy)$ Distribute and simplify.

$= 2xy(5x^2y) + 2xy(3xy^2) + 2xy(7xy)$

$= 10x^{1+2}y^{1+1} + 6x^{1+1}y^{1+2} + 14x^{1+1}y^{1+1}$

$= 10x^3y^2 + 6x^2y^3 + 14x^2y^2$

Reflect

5. Is the product of a monomial and a polynomial always a polynomial? Explain. If so, how many terms does it have?

Yes. One term x many terms = many terms. The product will have as many terms as the original polynomial

Your Turn

6. $2a^2(5b^2 + 3ab + 6a + 1)$

$2a^2(5b^2) + 2a^2(3ab) + 2a^2(6a) + 2a^2(1)$

$10a^2b^2 + 6a^3b + 12a^3 + 2a^2$

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Algebra 1
Period 3
Assignment Week #1

WHY ARE MR. AND MRS. NUMBER SO HAPPY?

Find the simplest form for each expression below in the adjacent answer column. The letter of the exercise goes in the box that contains the number of the corresponding answer.

E	$x^3 \cdot x^4$	19	$-3x^6$
O	$3x^2 \cdot x$	14	$3x^3$
T	$2x^2 \cdot 3x$	25	x^9
I	$x \cdot x^2 \cdot x^3$	7	x^7
A	$x^4(-3x^2)$	10	x^6
H	$(-2x^2)(-2x)$	2	$4x^3$
E	$x(-x^4)(-x^4)$	23	$6x^3$

T	$(u^2v)(-6uv^2)$	21	$-8u^6v^4$
E	$v(uv^2)(u^3v)$	3	u^4v^4
I	$(4uv)(-u)(2u^4v)$	12	$-8u^6v^2$
A	$(-3u^2)(-u^2v^2)(2uv)$	17	u^3v^7
L	$(-u^2)(-6u^2v^3)(-u^3v^4)$	5	$6u^5v^3$
G	$(-2u)(u^2v)(4u^3v^3)$	13	$-6u^3v^3$
V	$(\frac{1}{2}u^2v^3)(2uv^4)$	24	$-6u^7v^7$

R	$(ab^2)(a^2b)$	18	$5a^6b^4$
A	$(3ab)(2a^3b)$	6	a^3b^3
G	$ab(-4ab^3)$	26	$12a^2b^8$
E	$(-a^4b)(-5a^2b^3)$	8	$-4a^2b^4$
T	$(-2a^3b)(2ab^3)$	11	$-12a^3b^7$
N	$(6a^2b^2)(-2ab^5)$	1	$-4a^4b^4$
O	$(-4ab^4)(-3ab^4)$	16	$6a^4b^2$

L	$(-b^2)(9a^2b^3)$	22	$-a^3b^5c^2$
Y	$(3a^2c)(-3bc^2)$	27	$-ab^3c^2$
E	$c(-ab)(a^2b^2c^2)$	28	$-a^3b^3c^3$
O	$(-3a^2c)(-3b^2c)$	15	$9a^3b^3c^5$
T	$(-ab)(-b^2c^2)(-a^2b^2)$	4	$-9a^2bc^3$
H	$(a^2bc^2)(b^2c^3)(9a)$	20	$-9a^2b^5$
N	$(3b^2)(\frac{1}{3}abc)(-c)$	9	$9a^2b^2c^2$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

OBJECTIVE 1–e: To multiply monomials.

MathBitsNotebook Algebra 1

Multiply Binomial by Binomial

MathBitsNotebook.com

Statement: When multiplying a binomial times a binomial, each term of the first binomial must be multiplied by each term of the second binomial. Like terms are then combined.

Vhen multiplying two binomials, **four** multiplications must take place. These multiplications can occur in ny order, as long as each of the first two terms is multiplied by each of the second two terms.

'here are numerous ways to set up the multiplication of two binomials. The two basic formats, horizontal ine-up and vertical line-up, are similar to what we saw in adding and subtracting polynomials. Let's nvestigate the simple product $(x + 2)(x + 4)$ with a variety of set-ups.

Horizontal "Distributive" Set-up: (most commonly seen set-up)

$$(x+2)(x+4)$$

- Start with the first term of the first binomial (the **blue** x).
- Distribute (multiply) this term times EACH of the terms in the second binomial $(x + 4)$.
- Then take the second term in the first binomial (including its sign: $+2$) and distribute (multiply) this term times EACH of the terms in the second binomial $(x + 4)$.
- Add the results, combining like terms when needed.
- This method will work with all polynomials, not just binomials times binomials.

$$(x+2)(x+4) = x\bullet(x+4) + 2(x+4)$$
$$= x\bullet x + x\bullet 4 + 2\bullet x + 2\bullet 4 \quad \text{distribute}$$
$$= x^2 + 4x + 2x + 8 \quad \text{combine like terms}$$
$$= x^2 + 6x + 8 \quad \text{Answer}$$

Did you see the distributive property at work in this first set-up?

$$(x+2)(x+4) = x\bullet(x+4) + 2(x+4)$$

The first distributive property (right to left) application treats the (x + 4) as one term.

$$x\bullet(x+4) + 2(x+4) = x\bullet x + x\bullet 4 + 2\bullet x + 2\bullet 4$$

The second distributive application (left to right) is applied twice.

Vertical "Distributive" Set-up: (same process as multiplication of numbers)

$$\begin{array}{r} x+2 \\ \underline{x+4} \\ 4x+8 \\ \underline{x^2+2x} \\ x^2+6x+8 \end{array}$$

- Line up the binomials (or any polynomials) as you would for multiplying large numerical values.
- Following the pattern of number multiplication, start with the right-hand term of the bottom binomial ($+4$). Multiply this value times both terms of the top binomial.
- Now move to the left-hand term of the bottom binomial (x). Multiply this value times both terms of the top binomial. Line up like terms as you write the answer.
- Add the columns.

"Grid" Set-up: (a table version of the distributive property clearly showing the 4 multiplications)

- Place one binomial at the top of the 2x2 grid (for binomials).
- Place the other binomial on the left side of the grid.
- Position the terms so that each term (and its sign) lines up with a row or column of the grid.
- Multiply each intersecting row and column to fill the interior of the grid.
- Combine like terms in the interior of the grid.

Notice that the x-terms lie on the diagonal of the grid.

	x	$+2$
x	x^2	$2x$
$+4$	$4x$	8

The size of the grid can be adjusted to work with binomials, trinomials or other polynomials.

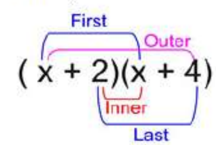
	x	$+2$
x	x^2	$2x$
$+4$	$4x$	8

$$= x^2 + 2x + 4x + 8$$
$$= x^2 + 6x + 8$$

The next set-up works ONLY with binomials times binomials. While you may find this method helpful, you must remember that this method will not work in any other situations. For example, to multiply a binomial times a trinomial you will need to use one of the three more "universal" distributive methods stated above.

"FOIL" Set-up: (for binomial multiplication ONLY!)

- Multiply **F**irst **O**uter **I**nner **L**ast.
- Add your results.
- Combine like terms.
- Remember that this method has limited usage (binomials only).



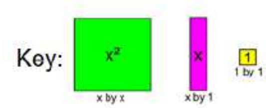
F: $(x+2)(x+4)$
O: $(x+2)(x+4)$
I: $(x+2)(x+4)$
L: $(x+2)(x+4)$

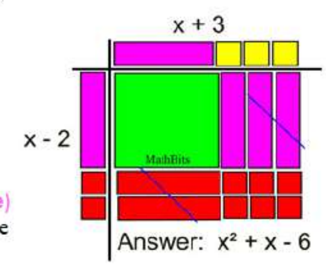
This process is actually just a naming system for the distributive property as it relates to binomials (only). It creates the four needed multiplications.

$$(x+2)(x+4)$$
$$= x^2 + 4x + 2x + 8$$
$$= x^2 + 6x + 8$$

Binomial Multiplication with Algebra Tiles:

This set up of Algebra tiles gives you a "visual" demonstration of multiplying a binomial $(x - 2)$ times a binomial $(x + 3)$.





The red tiles represent negative values. The positive (purple) and negative (red) x-tiles cancel one another when reading the answer inside the grid. See more about Algebra Tiles.

Name ______________________ Date ________

7.2 CW 2: Multiplying Polynomials Notes

Distributive Property

$(x+3)(x+4)$	$(x+2)(x-7)$	$(2x-7)(3x+5)$
$x(x+4) + 3(x+4)$	$x(x-7) + 2(x-7)$	$2x(3x+5)\ -7(3x+5)$
$x^2 + 4x + 3x + 12$	$x^2 - 7x + 2x - 14$	$6x^2 + 10x - 21x - 35$
$x^2 + 7x + 12$	$x^2 - 5x - 14$	$6x^2 - 11x - 35$

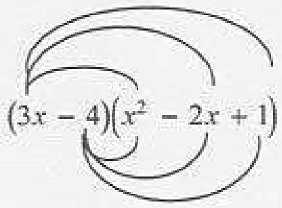
FOIL Method: To multiply two binomials use the FOIL Method, and then combine like terms.

Muliply: $(x+1)(x+2)$

$(x+1)(x+2)$
$= x^2 + 2x + x + 2$
$= x^2 + 3x + 2$

First terms,	$(x+1)(x+2)$	➡	$x(x) = x^2$
Outer terms,	$(x+1)(x+2)$	➡	$x(2) = 2x$
Inner terms, and	$(x+1)(x+2)$	➡	$1(x) = x$
Last terms.	$(x+1)(x+2)$	➡	$1(2) = 2$

To multiply polynomials with more than two terms each, multiply each term from the first polynomial with each term from the second. Then combine like terms.



$(3x-4)(x^2-2x+1)$
$3x\,(x^2-2x+1)\ -4\,(x^2-2x+1)$
$3x^3 - 6x^2 + 3x - 4x^2 + 8x - 4$
$3x^3 - 10x^2 + 11x - 4$

Another method that can be used to multiply polynomials is to organize the terms into a table, multiply, and then combine like terms

Two Ways

Horizontal:
Muliply: $(x-3)(x^2-4x-4)$

$(x-3)(x^2-4x-4)$
$= x^3 - 3x^2 - 4x^2 + 12x - 4x + 12$
$= x^3 - 7x^2 + 8x + 12$

Area Model

	x	-3
x^2	x^3	$-3x^2$
$-4x$	$-4x^2$	$12x$
-4	$-4x$	12

Student Name:

Teacher Name: Medek

Subject: Algebra 1

Period: 3

Assignment Week #: 1

7.2 Multiplying Polynomials Notes

In Exercises 1-12, find the product. Show your work!

1. $(x+2)(x-3)$	2. $(z+3)(z+2)$	3. $(h-2)(h+4)$
4. $(2m-1)(m+2)$	5. $(4n-1)(3n+4)$	6. $(-q-1)(q+1)$
7. $(x-2)(x^2+x-1)$	8. $(2-a)(3a^2+3a-5)$	9. $(h+1)(h^2-h-1)$
10. $(d+3)(d^2-4d+1)$	11. $(3n^2+2n-5)(2n+1)$	12. $(2p^2+p-3)(3p-1)$

Student Name:

Teacher Name: **Medek**

Subject: **Algebra 1**

Period: **3**

Assignment Week #: **1**

7.2

Multiplying Polynomials
Use any method to multiply, but show your work!

How Did The Doe Win The Race?

Write the letter of each answer in the box containing the exercise number. **Show work on a separate page!!!**

Find the product.

1. $(x+7)(x+5)$ **2.** $(x+9)(x-4)$

3. $(x-6)(x-3)$ **4.** $(x-8)(x-2)$

5. $(4x+11)(x-1)$

6. $(6x+7)(x+3)$

7. $(2x-9)(-5+4x)$

8. $(x-10)(x+1)$

9. $\left(x-\frac{7}{4}\right)\left(x-\frac{1}{4}\right)$

10. $(2-3x)(11x+8)$

11. $(x-6)(x^2+9x)$

12. $(x+5)(x^2+4x+4)$

13. $(x-7)(x^2+2x+1)$

14. $(x-8)(x^2-7x+12)$

15. $(6x^2-3x+5)(4x^2+3)$

Answers

H. $x^2-9x-10$

U. $x^2-10x+16$

B. $x^3+9x^2+24x+20$

I. $6x^2+25x+21$

S. x^3+3x^2-54x

E. $x^2+12x+35$

P. $24x^4-12x^3+38x^2-9x+15$

K. $x^3-5x^2-13x-7$

T. $4x^2+7x-11$

B. $x^2+5x-36$

A. $x^2-2x+\frac{7}{16}$

N. $x^3-15x^2+68x-96$

Y. $-33x^2-2x+16$

S. $x^2-9x+18$

G. $8x^2-46x+45$

C. $90x^2+134x+48$

16. The length of a classroom is $(10x+6)$ feet. The width of the classroom is $(9x+8)$ feet. Find the area of the classroom.

2	10		15	9	11	3	6	14	7		5	8	1		12	4	16	13